UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/837,834	04/18/2001	John A. Corey	107044-0007	9684

24267 7590 05/26/2004

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
CHANEY, CAROL DIANE	
ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 05/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/837,834	COREY ET AL.	
	Examiner	Art Unit	
	Carol Chaney	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 February 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1,2,5-7,10-12,15,16,19,20 and 23* is/are rejected.

7)☐ Claim(s) *3,4,8,9,13,14,17,18,21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 April 2001* is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 24 February 2004 has been entered.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 6, 7, 11, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Bahar et al., US Patent RE 37656

Bahar et al. disclose a composite layered structure comprising an expanded polytetrafluoroethylene (PTFE) membrane impregnated with an ion exchange material. The ion exchange material substantially impregnates the membrane so as to render an interior volume of the membrane substantially occlusive, and thus impermeable to water and carbonaceous fuel. (column 2, lines 43-64.) In a preferred embodiment, NAFION is brushed onto both sides of a microporous PTFE membrane, thus providing protonically conductive membranes on both sides of an impervious layer. (Column 11, lines 38-53.) The filled micropores in the PTFE are sites which allow protonically

conductive contact between the outer NAFION layers. The composite layered membrane disclosed by Bahar et al. includes a central "barrier layer" of expanded PTFE, which is a substantially protonically non-conductive material and layers of NAFION on both sides of the barrier. As noted by the applicants, the expanded PTFE has a porous microstructure. Since these pores are filled with NAFION, they provide passages through the barrier layer enabling protonically conductive contact through the passages between the first and second membranes, as recited in applicants' claims.

It would appear that the size of the pores in applicants barrier layer distinguishes applicants invention from the prior art. As note by the applicants, in the instant invention, the pores in barrier layer 34 need only be large enough (relative to barrier thickness) to allow the proton conductive membrane materials 36a, 36b to make contact through the barrier layer, while remaining small enough to prevent the passage of liquid water, and to some extent methanol.

Claim Rejections - 35 USC § 103

Claims 1, 2, 5, 10, 15, 16, 19, 20, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahar et al. for reasons of record. The rejection is repeated below for convenience.

As discussed above, Bahar et al. disclose applicants' invention essentially as claimed, with the exception that Bahar et al. do not specifically disclose a direct oxidation fuel cell, or the catalytic and diffusion layers for such a fuel cell. Bahar et al. teach that the ion exchange materials of their inventive membrane may be include

powders such as carbon black, graphite, nickel, silica, titanium dioxide, or platinum black to provide catalytic effects. (Column 5, lines 2-11.) Therefore, catalyst layers as recited in applicants claims 1, 2, 5, 10, 15, 16, 19, 20, and 23 would have been obvious to one of ordinary skill in the art based upon the teachings of Bahar et al.

Bahar et al. teach the membrane of the present invention may be used for a fuel cells and the use of the membrane results in fuel cells with improved ionic conductance and water transport across the membrane, and require less fuel gas humidification. (Column 10, lines 58-65.) This teaching of the Bahar et al. invention generically in polymer-electrolyte fuel cells is considered to encompass teaching the use of the membrane in direct methanol fuel cells. Thus, applicants' invention as a whole would have been obvious to one of ordinary skill in the art based upon the teachings of Bahar et al.

Allowable Subject Matter

Claims 3, 4, 8, 9, 13, 14, 17, 18, 21 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to suggest membrane assemblies as claimed having a polyester or polyimide layer which is substantially impervious to water and carbonaceous fuel.

Response to Arguments

Applicant's arguments filed 24 February 2004 have been fully considered but they are not persuasive.

The prior art includes the features of a barrier layer (a PTFE layer) and protonically conductive layers on both major faces of the barrier layer. It would appear that the size of the pores in applicants barrier layer distinguishes applicants invention from the prior art. As noted by the applicants, in the instant invention, the pores in barrier layer 34 need only be large enough (relative to barrier thickness) to allow the proton conductive membrane materials 36a, 36b to make contact through the barrier layer, while remaining small enough to prevent the passage of liquid water, and to some extent methanol. In contrast, the pores formed in the barrier layer Bahar do not have specific size requirements. However, pore size limitation is not recited in applicants' claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (571) 272-1284. The examiner can normally be reached on Mon - Fri 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Carol Chaney
Primary Examiner
Art Unit 1745

17 May 2004